

THE
AMERICAN JOURNAL
OF THE MEDICAL SCIENCES.

AUGUST, 1892.

A CONTRIBUTION TO THE STUDY OF HEPATIC ABSCESS.¹

BY WILLIAM C. DABNEY, M.D.,
OF VIRGINIA.

THIS paper was suggested by several cases occurring in my own practice, or seen in consultation, in which some of the most characteristic of the usual symptoms or signs of hepatic abscess were wanting when such an abscess was present, or else in which the symptoms were singularly suggestive of the affection and yet no abscess existed.

It is based in great part upon the analysis of one hundred and eight cases collected from various sources, but I have in some places, when it seemed advisable, utilized other material as well as this.

The paper is not intended as an exhaustive review of the subject, but I trust the facts which I hope to bring out will help to clear up some of the obscure points in connection with this disease.

The first question which presents itself, of course, in any systematic study of suppuration in the liver is the nature of the germs or substances which cause this suppuration, but I do not feel qualified to express an opinion on this point. It seems to me, however—if I may venture to express *any* opinion—that the investigations of Hankin, Prudden, Hodenpyl, Welch, and others tend to show that there are quite a number of germs and substances which are capable of causing pus formation under favorable conditions.

That some bacteria or their products, however, are directly connected with the formation of hepatic abscess is almost if not quite certain, and we have next to inquire *from what points these bacteria or their products come and through what channels they reach the liver.* There are several

¹ Read before the Association of American Physicians at Washington, May, 1892.
VOL. 104, NO. 2.—AUGUST, 1892.

conceivable channels through which pyogenic germs or substances may reach this organ.

By the bloodvessels. Entrance of germs by the hepatic artery was formerly considered a common cause of hepatic abscess, and it was claimed that injuries of the head or of the bones generally were especially apt to cause this affection. Frerichs, for instance, stated that "the supervention of hepatic abscess from inflammation of the veins of the systemic circulation was of far more common occurrence than abscess arising from phlebitis of the portal veins;" but this view does not accord with the facts, so far as definite information can be obtained. Waldeyer found hepatic abscess in only six per cent. of those who died from surgical diseases, while embolic processes in the lungs were present in more than two-thirds; and Klebs found that "thirty-two cases with metastasis in the lungs occurred to eight in the liver."¹

Barrensprung (quoted by Thierfelder) states that in thirty-three cases of traumatic diseases resulting from injuries of the head, hepatic abscesses were found in six; and Prescott Hewitt, in eighteen injuries of the head, found hepatic abscesses in three and abscesses of the lungs in thirteen.²

It would scarcely be proper to make any use of the records of our civil war in this connection, because the constant strain and pressure to which the surgeons both North and South were subjected during those troublous times left them but little time for careful pathological research; but it is not probable that if hepatic abscesses had been of frequent occurrence they would have been overlooked so completely by all the surgeons on both sides; and yet in 12,980 cases of injuries of the head which are reported in the first surgical volume of the *Medical and Surgical History of the War of the Rebellion* I can find no record whatever of an abscess of the liver and but one case which suggests this affection—death being attributed in this to "hepatitis." In addition to this one case of hepatitis, nine of pyæmia are reported, but the seat of the abscesses in these cases is not mentioned.

Of the one hundred and eight cases which I have tabulated for the purposes of the present study there is but one in which it seems in the slightest degree probable that the embolus leading to the hepatic abscess passed through the systemic veins and the hepatic artery to reach this organ. In this case, reported by Harris,³ a man entered the hospital for an ulcer on the leg; about two months after admission an hepatic abscess formed; was aspirated, and later incised and drained, and the patient recovered.

The occurrence of hepatic abscess in connection with or as a result of malignant endocarditis ought, it would seem, to be of comparatively

¹ Ziemssen's Cyclopædia, vol. ix. p. 99.

² Holmes's System of Surgery, vol. i.

³ Lancet, Oct. 1, 1887.

common occurrence—much more common at least than in those cases where the primary disease is so situated that the embolus has to pass through the lungs before it can reach the arterial system; but, as a matter of fact, very few cases have been reported, so far as I can learn. Thierfelder refers to two—one reported by Mayer and one by Buckling—but the size of the abscesses in these cases is not mentioned. It is probable that this form of cardiac disease runs such a rapid course, and the general symptoms are so pronounced, that the hepatic disease is overlooked before death, and it is also probable that the hepatic abscesses would be of small size and little practical importance. We are justified in concluding, it seems to me, that the occurrence of hepatic abscess from injuries or diseases of the bones or other parts of the body, except those immediately adjacent to the liver, or else directly connected with the portal system of veins, is rare, and the slight danger which formerly existed in such cases has been in great measure removed by the anti-septic or aseptic method of treating wounds.

The conveyance of pyogenic germs or substances by the *hepatic veins* and the consequent formation of abscess in the liver must be extremely rare, if such a thing ever occurs. I can find no cases which seem to have originated in this way, though Younge states¹ that the large single tropical hepatic abscesses are connected with the hepatic veins; the small, multiple ones with the portal veins. There is abundant evidence, however, that the large so-called tropical abscesses are often, if not generally, connected with the portal vessels. Mr. Godlee says:² "It appears to be certain, also, that thrombosis and subsequent suppuration may occur in the hepatic veins or their tributaries," but he gives no cases in proof of the statement.

Pyogenic infection through the portal system of vessels is usually considered the most common source of origin of hepatic abscesses, and in a very large proportion of cases which have been carefully studied there seems to have been ulcerative disease of some of the organs connected with the portal system or there was a history of such ulceration at some previous time. Thus, in one hundred and fifty-six cases of acute or chronic catarrhal inflammation of the intestinal mucous membrane *without* ulceration, occurring during our civil war, there was but one case of hepatic abscess, while there were fourteen cases of multiple abscesses and nine of large single abscesses occurring in five hundred and eleven cases of flux in which the intestine was ulcerated."³ In a considerable proportion of cases, however, there is no history of previous disease of the intestines or any of the organs connected with the portal system.

Of the one hundred and eight cases which I have studied, there were

¹ Med. Press and Circular, Aug. 14. 1889.

² British Medical Journal, 1890.

³ Medical and Surgical History of the War of the Rebellion, vol. ii. p. 548.

only forty-seven in which there had been a history of disease of any of these organs or in which post-mortem examination showed that such disease had existed; and in one, at least, of these cases the dysentery had existed so long before (eight years) that its connection with the hepatic abscess is *extremely* doubtful. Of the forty cases reported by physicians in this country, eleven were apparently due to disease of the organs connected with the portal system, and in sixteen the cause was unknown; in several of these cases it was distinctly stated that there was no history of diarrhœa, dysentery, or any other disease. The individual diseases and injuries of the organs connected with the portal system to which hepatic abscess has been attributed are (1) dysentery, (2) appendicitis, (3) gastric and duodenal ulcer, (4) operations on or diseases of the rectum, (5) typhoid fever, (6) suppuration of the umbilical veins in infants, (7) ulceration of cervix uteri, (8) peri-uterine inflammation, (9) suppurating ovarian cysts, (10) lithotomy operations.

Before going further it will be well to call attention to the fact that the word "pyæmic" in connection with hepatic abscess is used differently by different writers on the subject.

It is used by some to denote all those abscesses which result from the lodgment of an embolus in the bloodvessels of the liver, and by others it is restricted to those cases which occur in connection with well-marked symptoms of general septicæmia. While it is hard, perhaps, to draw a fast and sharp line between these two classes of cases, it seems to me better, from a clinical point of view, to use the word pyæmic in the restricted sense. The first fact which strikes one in connection with ulceration of the intestinal canal and hepatic abscess is that all forms of ulceration do not lead to abscess. Sir Dyce Duckworth states¹ that it does not result from either tubercular or typhoid ulceration. As to the second of these he is clearly mistaken, as I shall show a little later on, but I have not been able to find any cases which were clearly due to tubercular ulceration of the bowel. In the case reported by Thorowgood,² it is probable that the pus-like collections in the liver were really broken down tubercle and not pus. A probable explanation of the circumstance that tubercular ulcers of the bowel do not cause hepatic abscess is to be found in the fact that tubercles are so scantily supplied with bloodvessels.

The ulceration of typhoid fever is a rare source of abscess of the liver. Bernhard reports³ a case following typhoid fever and terminating fatally in which the cicatrices of the typhoid ulcers were found at the autopsy. Musser refers⁴ to a case in which the intestinal ulcers had healed, but the mesenteric glands had suppurated. It is not easy to understand why

¹ Lancet, April 23, 1887.

² Ibid., 1889, ii. p. 263.

³ Jahrb. für Kinderheilk., 1886, p. 303.

⁴ Cyclopædia of Dis. of Children.

hepatic abscess should be so rarely connected with typhoid ulceration. Arnaud advanced the view¹ that it was due to the fact that Peyer's patches are connected with the lymphatics, and that the vessels are comparatively little involved in typhoid fever, but this view is scarcely tenable. Luchtmanns² found "follicular ulcers" of the intestines in sixty-one of one hundred and two cases of hepatic abscess, and, furthermore, Peyer's patches are very abundantly supplied with bloodvessels.

Ulceration of the bowel, which often causes dysenteric symptoms, and hence is spoken of as dysentery simply, is usually considered the most common cause of hepatic abscess; but it was frequently remarked, even before the investigations of Councilman and Laflaur, that the dysentery was unlike the common form, and was often mild in character.

Younge mentions³ that dysentery was extremely common during the Crimean war, but only one hepatic abscess was reported, and he refers also to the statistics of Niemeyer and of Finger, who report three hundred and eleven autopsies in cases of dysentery without finding a single hepatic abscess. Cullimore states⁴ that he was informed by Dr. Danford Thomas that he never saw a case of hepatic abscess during his term of service as coroner of London. Sir Dyce Duckworth says⁵ that ordinary dysentery does not cause hepatic abscess, and Bartholomew⁶ makes a similar statement.

In many cases the ulceration of the bowel and the dysenteric symptoms are so mild in character as scarcely to attract attention. Dickinson reports⁷ a case in which there was a large hepatic abscess, with no symptoms or history of dysentery, but at the autopsy ulceration of the colon was found. Keiner and Kelsch refer⁸ to a case reported by Moxon to the Medical Society of London, in which diarrhœa was present for one day only; death occurred from the opening of an hepatic abscess into a large vein, and at the autopsy a very small ulcer was found in the colon.

De Gennes and Kirmisson report⁹ a case in which the discharges from the bowels were abundant and glairy in character, and there was little tenesmus.

In many cases, on the other hand, the ulceration of the bowel is deep and extensive, as in the cases described by Councilman and Laflaur.

It is evident, therefore, that so far as ulceration of the bowel is concerned, the hepatic abscess is not due to the character of the intestinal ulceration; and it is almost certain, if not positively established, that it

¹ Marseille Méd., 1887, p. 146.

² Med. Press and Circular, August 14, 1889.

³ Loc. cit.

⁴ Trans. Path. Soc. of London, 1862.

⁵ Ibid., 1886, ii. p. 288.

⁶ Quoted by Thierfelder.

⁷ Ibid., November 30, 1887.

⁸ Pepper's System of Medicine.

⁹ Archives Gén. de Méd., Sept. 1888.

is due to the character of the substances formed in the intestinal ulcers, and carried thence to the liver.

There are two or three other questions in connection with hepatic abscess consequent on dysentery which are of interest, namely: (1) How soon after an attack of dysentery commences may hepatic abscess develop? and (2) How long a time must elapse after apparent recovery from dysentery until the danger of hepatic abscess is over?

To the first of these questions a definite answer can be obtained. In the cases of amebic dysentery reported by Councilman and Lafleur there was distinct evidence of pus formation in the liver in three weeks in two cases and in five weeks in one case. Indeed, they themselves put the time¹ at two weeks in one case, but they say the usual time was from the fourth to the twelfth week. In a case reported by De Gennes and Kirrison the intestinal trouble occurred early in September and lasted fifteen days; the abscess had clearly formed by September 20th, and was aspirated October 17th. Geschwind reports² a case in which, three weeks after the first symptoms of dysentery, pus was expectorated; a little later a small quantity was aspirated, and then an incision was made through which three-fourths of a litre were discharged.

A case almost exactly similar is reported by Barthélemy and Bernardy,³ pus being obtained on aspiration in three weeks from the commencement of the dysenteric attack, and the case being then treated by free incision, with recovery.

It is extremely difficult—practically impossible, in fact—to say how long a time must elapse after *apparent* recovery from dysentery before the patient is free from the danger of hepatic abscess. There are two obvious difficulties in the way. In the first place, ulceration of the bowel may continue long after the dysenteric symptoms have disappeared, and, secondly, an hepatic abscess may remain latent for an indefinite time. Cullimore states⁴ that of twelve cases occurring in his practice in India, dysentery “immediately preceded” the abscess in only two. Lamb has reported⁵ a case in which a man had dysentery in August, and an hepatic abscess showed itself the following December; but in this case, though the dysenteric symptoms had disappeared four months before, the cæcum was found ulcerated at the autopsy. Muselier reports⁶ a case of multiple abscesses of the liver, in which the man had dysentery in Guadaloupe some months before. In another case the patient had dysentery six months before the abscess appeared, and Olliphant reports⁷ a case in which “diarrhœa” occurred a year before. A

¹ Johns Hopkins Hospital Reports, vol. ii. p. 466.

² Arch. de Méd. et Pharm. Militaire, 1889, xiv. p. 203. ³ Ibid., 1890, xv. p. 288.

⁴ Loc. cit.

⁵ New Orleans Med. and Surg. Journ., February, 1887.

⁶ Gaz. Méd. de Paris, November, 1885.

⁷ New Orleans Med. and Surg. Journ., May, 1887.

case presenting several peculiar features is reported by Guyot:¹ A man, thirty-eight years old, had suffered with chronic dysentery, but he had apparently recovered three years before the hepatic abscess appeared. In September he was taken sick with indigestion, weakness, pain in the right flank, and gradual emaciation; *he had no fever*; by January there was decided swelling on the right side, and great pain and tenderness; aspiration showed the presence of pus, and a month after one aspiration, at which 1500 grammes of pus were withdrawn, the patient was well. Quite a number of cases have been reported in which dysentery preceded abscess formation by several years; thus, O'Donnell,² after stating his belief that ulceration of the bowel is a rare cause of hepatic abscess outside the tropics, mentions a case in which dysentery preceded the abscess by nine years; and Faunce and Rowan report³ a case of abscess occurring eight years after dysentery. At first sight one would suppose that there could be no possible connection between the dysentery and the hepatic abscess in these cases, nor is it probable that there *was* any connection, but it is certain that ulceration may exist in the bowels for a long time after apparent recovery from dysentery, and an hepatic abscess may remain latent for a long time certainly, but just how long is not known. Another interesting fact just here is that dysentery may recur in the same person one or several times after an interval of several months or even several years. A case of this kind has recently come under my observation. A gentleman was taken, in the autumn of 1881, after a visit to a marshy section of Virginia, with a severe attack of dysentery; he recovered in a few weeks' time, but in 1884 and in 1888 he had similar attacks. In January last he was again attacked, and I saw him in consultation in February. An examination of the discharges, made by my colleague, Prof. Tuttle, showed that they contained amœbæ. The case ran a tedious course, but finally ended in recovery.

The entrance of pyogenic substances into the liver by the *lymphatics* is of questionable occurrence; but it seems to me highly probable that the frequent extension of such abscesses into the adjacent pleura and lung may occur through the lymphatic vessels of the liver, "which communicate with the thoracic lymphatics through the triangular ligament and suspensorium."

Suppuration may occur around the *bile-ducts* and lead to abscess formation from several different causes: (1) Retention of bile;⁴ (2) the

¹ Bull. et Mém. de Soc. Méd. des Hôpitaux, 1886, p. 368.

² Med. Press and Circular, June 19, 1889.

³ Indian Med. Journ., 1888, p. 539.

⁴ Godlee says the simple distention of the bile-ducts does not cause abscess; that it only occurs when some foreign body, such as a gall-stone or a worm, causes ulceration of the duct.

presence of gall-stones; (3) the entrance into the ducts of intestinal worms; (4) probably, also, from an angiocholitis of unknown origin.

Cases of this character do not seem to be very common when compared with the total number of hepatic abscesses reported, but if so-called tropical abscesses be left out, they are probably comparatively common. Musser has collected seven cases in which the abscesses were caused by round worms, and other cases have been reported. One of the most remarkable was reported¹ by Bates a number of years ago. A negro child, three years old, was taken with violent pain in the belly, paroxysmal in character and very severe; there was great tenderness over the region of the liver, and the organ was somewhat enlarged; the child lived nine days. At the autopsy two abscesses were found in the liver, one of which contained one and one-half ounces of pus; in addition to these abscesses, however, forty-two round worms were found in the substance of the liver, and similar worms were found in the intestines.

Of thirteen cases of multiple small abscesses collected by Carrington,² three were due to obstruction to the outflow of bile. Leyden also reports³ a case of multiple small abscesses due to gall-stones, and a similar case is reported by Harris.⁴ In Harris's case there were many small abscesses in the pancreas, as well as in the liver. So far as I can learn from the reported cases, abscesses which originate from trouble about the bile-ducts are usually small in size and multiple, but this is not always the case. Polaillon⁵ reports a case of very large single abscess beginning as an angiocholitis, and Kermisson⁶ one due to gall-stones in which there were one large and several small abscesses. The abscesses were in the right lobe. The biliary canals were "enormously dilated," the pus was thick and yellow, the wall of the abscess dark, and small bloodvessels opened into the abscess; there was also a small abscess in the right lung.

Spread of suppurative inflammation from adjacent parts or organs may occasionally induce hepatic abscess. Beckham has recorded⁷ a case in which an abscess originally between the abdominal wall and liver, or possibly in the abdominal wall, extended to the liver, and caused erosion or ulceration of its outer surface; there was a fistulous opening into the sac, through which pus and fragments of hepatic tissue were discharged. Councilman and Lafleur think it probable that there was a direct passage of amœbæ from the colon to the liver in some of their cases of amœbic dysentery.

¹ New Orleans Med. and Surg. Journ., March, 1846.

² Guy's Hosp. Reports, vol. xxvi.

³ Charité Annalen, 1886.

⁴ Indian Med. Journ., 1885, p. 603.

⁵ Gazette Méd. de Paris, June 18, 1887.

⁶ Bull. Soc. Anatomique, 1873, p. 674.

⁷ New Orleans Med. and Surg. Journ., 1867, p. 67.

In the cases where it was supposed to result from pneumonia, it is more probable that the abscess was the primary condition, and the pneumonia resulted from it.

Injuries of the liver lead to hepatic abscess in a considerable number of cases, and these injuries may be penetrating wounds, simple contusions without external injury, or they may cause fracture of the ribs, and lead to hepatic abscess, and possibly cause hepatic abscess secondarily.

I can find but three cases of hepatic abscess from penetrating wounds of the liver reported in the *Medical and Surgical History of the War of the Rebellion*. One of these was from a punctured subre wound, and the other two from shot injuries. In each case the abscess resulted very soon after the receipt of the injury.

As a rule, the abscesses due to other forms of injury, such as blows, appear in a few days. Eight of the one hundred and eight cases in the table were clearly due to injuries, and in these cases the interval from the receipt of the injury to the appearance of the abscess varied from four to thirteen days. Thus Barthélemy and Bernardy report¹ a case in which the abscess appeared four days after a blow; Tournier,² one four days after a blow on the belly and exposure to cold; Barth,³ one in which the liver was enlarged in three days, though pus was not aspirated for three months; Siredey,⁴ one in which a man received a kick from a horse, and pus was present in eight days, and Weir,⁵ one in which, after a fall on the buttocks, an hepatic abscess formed in thirteen days. In two cases the interval between the injury and the abscess formation is not stated, and in three, while the abscesses were supposed to have been due to injury, the evidence is by no means conclusive.

I shall have but little to say about the *general or local conditions which are favorable to the development of hepatic abscess*.

A *hot climate* is universally considered a potent factor, but it is quite evident that it is not the *heat* simply which is the active agent, because the disease is not equally common in all hot countries.

Perhaps the chief action of heat is in furnishing one of the conditions requisite for the growth and development of amœbæ; it is probable that those abscesses which are so greatly influenced by climatic conditions are amœbic in character.

Harley,⁶ Cullimore,⁷ and Younge⁸ think chilling of the body when

¹ Archives de Méd. et Pharm. Militaire, 1890, xv. p. 285.

² Provence Méd., November 22, 1890.

³ Bull. Soc. Anatomique, 1856, p. 111.

⁴ Ibid., 1858, p. 499.

⁵ New York Med. Record, April 29, 1882.

⁶ Med. Press and Circular, February 3, 1886.

⁷ Ibid., November 30 and December 7, 1887.

⁸ Ibid., August 14, 1889.

overheated a potent cause, and Cullimore claims that horseback riding is liable to induce it.

There is much difference of opinion with respect to the influence of *malaria*, but the weight of evidence seems to be clearly against any connection between the two diseases. Cullimore, Keiner and Kelsch, Dutrolau—in fact, nearly all writers on tropical affections—deny such a connection. Blanc,¹ on the other hand, considers *malaria* a powerful, predisposing cause, and Tomes² thinks *malaria* a frequent attendant on hepatic abscess. The rarity of hepatic abscess in those sections of the eastern part of the United States where *malaria* prevails, furnishes strong presumptive evidence against any connection between the two diseases; but Bartholow states that hepatic abscess is common in the Mississippi Valley, and of twenty cases occurring in the St. Louis Hospital reported by Robinson,³ in ten “intermittent fever,” “chills and fever,” or “chills” are mentioned as causative or complicating conditions. In seven of the ten cases, however, dysentery or diarrhœa had preceded the abscess; in two of the other three cases the chills and fever occurred during the time the abscess was forming, or after it had formed, and in the other there had been no chills for four years until about six weeks prior to the appearance of the abscess.

Mr. Godlee,⁴ in his lectures on the “Surgical Aspects of Hepatic Abscess,” states his belief that *malaria* is sometimes connected with abscess formation in the liver. It seems to me probable that the only real connection between *malaria* and hepatic abscess is to be found in the fact that the same conditions are favorable for the development of the plasmodium *malariae* and the amœba of amœbic dysentery. Possibly *malaria* may weaken the resisting power of the liver, and thus act as a predisposing cause also.

Intemperance is universally recognized as a predisposing cause of hepatic abscess in India, and it is probable that it is elsewhere. It is worthy of note, too, that even “moderate drinkers” are very liable to the disease in India. Hatch⁵ reports seventeen cases; of these seven used liquor to excess, and nine were moderate drinkers.

With respect to *age and sex*, adult males are far more liable to hepatic abscess than children or women. Chiefly, perhaps, because they are more exposed to the predisposing and exciting causes; but young people are by no means as exempt from this affection as was formerly supposed. Musser⁶ has collected thirty-four cases in persons under fifteen years old, and many other cases have been reported. Thus Hill records⁶ the

¹ Lancet, February 20, 1886.

² St. Louis Courier of Medicine, January, 1879.

³ Indian Med. Journal, 1887, p. 204.

⁴ Cyclopædia of Diseases of Children, vol. iii.

⁵ Lancet, October 9, 1886.

⁶ Lancet, January 5, 1889.

case of a boy nine years old, who had suffered from repeated attacks of periodical fever, in whom an hepatic abscess developed. It was incised and drained, and discharged nearly half a pint of greenish pus.

McClelland reports¹ the case of a girl eight years old, who swallowed a pin fourteen months before, and "about that time" had pain in the right groin; the case terminated fatally, and at the autopsy, one abscess the size of an orange, and many smaller ones were found in the liver, and one in the brain.

A case is also reported² by Pereira in a child twenty months old who had dysentery in November, and the abscess appeared in the following December.

Janeway has also reported² a case in a child three years old, and the case reported by Bates in a child of three years, has already been alluded to.

The usual *seat*, the *number*, and the *size* of hepatic abscesses are points of great practical importance with respect to prognosis and treatment.

The usual seat of an abscess is in the right lobe, and even when the abscesses are multiple, the right lobe is chiefly involved. Furthermore, it would seem that the *upper* part of the right lobe is involved rather more frequently than the lower part.

With respect to the number of abscesses, it is hard to get definite information. Of the 108 cases which I have studied there were multiple abscesses in 42 cases; while in 55 there was but 1; in 11 cases the number of abscesses were not stated. In those cases which complicate general septicæmia, it is quite certain that the abscesses are in the great majority of cases multiple in number and small in size, but these cases are of little *practical* interest at any rate, and it is of far more importance to determine, if possible, the size and number of the abscesses in those cases which offer some hope of relief from remedial measures.

Of the 8 cases in which the disease was *clearly* due to injury, there was but *one* abscess in 4 cases; in one there were 2; and in one 6; and in one (Siredey's case) "many;" in the other the number is not mentioned, but it would appear from the context there was but 1.

Of the 4 cases *probably* due to injury, in 2 there was but 1 abscess; in 1 there were several; and in 1 the number is not stated.

Of the 31 cases in which there was a history of either dysentery or diarrhœa, or in which ulceration of the large bowel was found, at the autopsy there were multiple abscesses in 15 cases.

In 14 cases there was but 1, and in 2 the number is not stated. Of

¹ Lancet, April 10, 1886.

² Indian Medical Gazette, June, 1890.

³ Trans. New York Med. Assoc., 1884.

38 cases in which the cause of the abscess could not be discovered, 27 were single, 9 multiple, and in 2 the number was not stated.

Eighteen of these 38 abscesses were reported in the United States, and of the 18, 15 were single, 2 multiple, and in 1 the number was not stated.

Twelve were reported by French physicians, and of the 12, 4 were multiple.

Eight were reported by English physicians, and of these 4 were multiple and 4 single.

One of the American cases reported here as one of multiple abscesses presented peculiar features. It is reported by Schoolfield in the *Cincinnati Lancet and Clinic* for December 28, 1889. In this case there were four abscesses, but they appeared at different times. The first burst into the lung, and a month after apparent recovery another abscess appeared, which was incised and drained in two weeks. Recovery seemed to be complete in a month's time, but two months after the second apparent recovery, a third abscess appeared, which was incised and drained in three weeks time; recovery was slower then, and was only complete after four months. Two months later still the abscess recurred for the third time, broke into the lung and abdominal cavity and caused death.

A somewhat similar case of recurrent abscess has been reported by Rozemont-Malbot. The first abscess in this case broke and recovery ensued; a second appeared twenty months later, was incised and drained, and the patient was well in forty days; five months later a third abscess appeared and was incised, but general peritonitis supervened and terminated fatally.

Of 8 cases of abscess due to obstruction of the bile-ducts, 7 were multiple and 1 single, and it is questionable whether that was actually located in the liver. In only 1 of the cases was there a large abscess.

Carrington has reported a case in which there were two large and many small abscesses, and he considered the combination very rare; but this view is clearly erroneous, as 7 other cases appear in the 108 which I have collected, in which there were one or two large, with many small abscesses in the same liver.

The relation of multiple abscesses to each other is a matter of direct and practical importance. In a general way it may be stated, perhaps, that the longer a case lasts the greater the probability that multiple abscesses will open into each other, but this fact does not, of course, justify delay in surgical treatment, because the longer the duration the greater, as a rule, is the destruction of hepatic tissue, and the greater is the danger of exhaustion or of the bursting of the abscess in some unfavorable direction. That the presence of one or more additional abscesses may cause death, after one has been opened and drained,

there can be no question. Ferron, for instance, reports¹ 47 cases of antiseptic hepatotomy for abscesses, in 8 of which the abscesses were multiple. Of the multiple cases 5 terminated fatally, while there was but 1 death in the 39 cases of hepatotomy in which the abscess was single.

Tournier has also reported² an interesting case of hepatic abscess due to injury, the presence of pus being evident four days after the injury was inflicted. One abscess in this case was opened by Vienna paste and incision, but the case terminated fatally, and at the autopsy another abscess was found which had not been opened.

A somewhat similar case is reported by Arnaud,³ in which the patient died twelve days after incision into one abscess; at the autopsy the abscess was found healed, but there was another present which had caused death.

Sometimes (how often I have not been able to learn) a second abscess will burst into the one which has been opened. Thus, Cliquet reports⁴ a case in which an abscess was incised and drained; there was temporary improvement, but fever, sweats, pain, and prostration recurred. Twenty-four days after the incision there was a sudden and profuse flow of pus, with immediate relief.⁵ It seems to me highly probable that the bursting of a second abscess into the cavity of one which has been opened must be of comparatively common occurrence, because the recoveries from hepatic abscess, when one sac only has been opened, are relatively much more frequent than single abscesses.

I shall have but little to say about the *contents* of an hepatic abscess, but there are two or three practical points which it may be well to mention. The first of these relates to diagnosis. It seems to be generally held that aspiration is quite a certain means of detecting the presence of pus, but this is clearly a mistake. Councilman and Lafleur mention the fact that in some of their cases of amebic abscess the contents were so thick that they would not flow through an aspirator needle, and in a case which I saw in consultation a year or two ago the contents of the abscess had undergone caseous degeneration, and aspiration gave a negative result.

It would be interesting to determine how long it takes for pus in the liver to undergo this caseous change, but there are hardly any facts

¹ Gazette hebdom. de Sci. Méd. de Bordeaux, 1887, p. 159.

² Provence Méd., November 22, 1890.

³ Marseille Méd., 1887, p. 146.

⁴ Archives de Méd. et Pharm. Militaire, 1896, i. 299.

⁵ I have recently seen a similar case in consultation. I incised and drained one abscess on May 15th; the patient improved greatly for a time, but fever and sweats recurred. On June 20th another abscess burst and discharged through the original opening, and on June 24th a third opened in the same way.

which throw light on this point. Nor would it be easy to determine it, at any rate, because of the frequency with which abscesses are latent.

In the single case which I have seen, it was about six weeks from the time the first symptoms of abscess appeared, till aspiration was attempted. The second point of practical interest in connection with the contents of an hepatic abscess is the frequency with which the contents are sterile. "Bacteria were found in 3 of the 6 cases" reported by Councilman and Lafleur. Laveran has reported¹ 2 cases which were sterile, and Netter, in the discussion following the reading of Laveran's paper, stated that of 13 cases of amœbic dysentery, Kartulis had found 8 sterile; of 9 cases of "idiopathic abscess of hot countries" 4 were sterile. He expressed the opinion, too, that the sterility was due to the long time the abscess had lasted—an opinion which is scarcely tenable in view of the rapid course of some of Councilman and Lafleur's cases.

Peyrot² has reported a case in which pus from an hepatic abscess of unknown origin escaped into the peritoneal cavity without any subsequent trouble, and he attributes the absence of peritonitis to the sterility of the pus. This sterility of the pus, or its *possible* sterility, might furnish a crumb of comfort when pus did escape into the abdominal cavity; but it would certainly not justify the failure to prevent such contamination as far as possible.

The presence of liver-cells in the contents of an hepatic abscess does not seem to be of very common occurrence. It is mentioned in 8 of the 108 cases. Occasionally their presence is of great value in diagnosis. A few years ago I saw a gentleman from Cincinnati who was supposed to be suffering from phthisis. At my first visit I found he had been taken a few hours before with profuse discharges of yellowish matter from his bowels. On microscopic examination these were found to consist of pus and fragments of hepatic tissue and liver-cells.

The condition of the walls of the abscess and the surrounding hepatic tissue depends in great measure on the duration of the abscess. In the very early stages there is no very sharp line of demarkation, but later on, the walls are distinct and ragged; still later, they may be thick and fibrous, and Haspel (quoted by Frerichs) states that the fibrous wall may be formed in twenty or twenty-five days; but it is evidently very hard, if not impossible, to say how long a time is necessary for this change in the wall to occur, for abscesses having such fibrous walls pursue a tedious course, and are often latent.

The surrounding tissue is often sound, but it may be fatty, as in cases reported by Dymock³ and Arnaud.⁴

¹ Bull. et Mém. de Soc. Méd. des Hôpitaux, 1890, p. 691.

² Bull. et Mém. de Soc. de Chirurg., February and March, 1891.

³ Indian Med. Gazette, 1866, p. 298.

⁴ Marseille Méd., 1887, p. 146 et seq.

The changes in the neighboring parts and organs are of great practical importance, especially the presence or absence of adhesions.

In 30 of the 108 cases which I have tabulated, the presence of adhesions is mentioned.

In 8 it is mentioned that there were *no* adhesions.

In 70 cases no mention is made of adhesions, one way or the other.

In 11 of the 30 cases, the abscess was due to dysentery, and in 7 of the 11 cases there were multiple abscesses.

In 16 cases the cause of the abscess was unknown, and in 5 of these there were multiple abscesses.

Adhesions were mentioned in only 1 case, when the abscess was due to injury, and then the adhesions were between the liver and the diaphragm.

In 20 of the 30 cases the liver was adherent to the abdominal walls.

A comparison of the symptoms present in those cases where adhesions existed, and in those where there were *no* adhesions, does not indicate any means by which their presence or absence may be determined.

Cliquet¹ thought that œdema of the abdominal walls over the seat of the liver was an evidence of adhesions having formed, but this view cannot be substantiated. The presence of this symptom is noted in only 2 of the 30 cases, and Ramonet has reported² a case in which this symptom was present, and in which he distinctly states adhesions were not present.

In 1 other case, however, not included in the 30, where adhesions certainly existed, there was extreme œdema of the skin, and adhesions probably existed because there was necrosis of the ribs in this case.

The *symptoms* of hepatic abscess are usually quite well marked, but are sometimes obscure and occasionally there are no symptoms pointing to hepatic disease.

Thus, Woolbut records³ a case in which a laboring man, in apparently perfect health, was suddenly seized with severe pain in the abdomen, followed by collapse, and terminating in death in a few hours' time; he had received no injury of any kind and had not had dysentery; at the autopsy, the left lobe of the liver was found ruptured, and in the right lobe were found one large and several small abscesses, the presence of which had never been suspected.

McLean⁴ speaks of a case in which a man died of phthisis, who had never presented any symptoms of hepatic trouble, but at the autopsy a cavity the size of a walnut, and containing a rusty needle swallowed two years before, was found in the liver; the abscess-cavity opened into the duodenum and drained in that way. He mentions also another

¹ Loc. cit.

² Archives de Méd. et Pharm. Militaire, 1889, p. 321.

³ Indian Med. Gazette, December, 1886.

⁴ Reynolds' System of Medicine.

case, in which a man with "no previous history of disease" walked seven or eight miles in search of work; soon afterward he complained of sudden pain, became collapsed, and died in a very short time. At the autopsy a large abscess with very firm walls was found which had suddenly burst into the pericardium.

Even close adhesions to surrounding parts may form apparently without giving rise to any symptoms; thus Robé reports¹ a case in which a woman died quite suddenly with pneumonia; there had been no hepatic symptoms during life; but at the autopsy an abscess holding four ounces was found in the liver, which contained several gall-stones, and was adherent to the stomach, pancreas, duodenum, and gall-bladder.

Tournier (*Provence Méd.*, November 22, 1890) reports a case also in which there were no symptoms pointing to the liver, but in which, at the autopsy, an hepatic abscess was found, and the organ was found closely adherent to the abdominal wall.

McLean expresses the opinion that those cases which present no symptoms are very chronic in course, and the abscesses have thick walls, but this is not always the case.

Souques has recorded² a case following old perityphlitis, which presented no symptoms pointing to the liver, but which ran a rapid course, and caused death before rupture of the abscess.

The onset of the symptoms in most cases of hepatic abscess is gradual, but now and then is very sudden.

Thus, in a case reported by Ferrand,³ the patient was taken suddenly with violent pain in the abdomen, with vomiting; he was constipated, but an enema brought away black, offensive matter; the symptoms continued; fever supervened, and the liver became moderately enlarged; death occurred in a month's time, and at the autopsy a number of abscesses, from the size of a bean to that of a pullet's egg, were found, containing grumous muco-pus; the walls were blackish and gangrenous, and there were adhesions to adjacent parts.

Of the usual symptoms of pus-formation—*rigors, fever, and sweating*—fever was present in a very large proportion of the cases.

Its presence is distinctly mentioned in 61 of the 108 cases; there was said to be an absence of fever in 5 cases, in which other symptoms of hepatic abscess were present, but the records are not sufficiently full to be satisfactory on this point. I am at this time attending a case in consultation, in which there is no fever during the day, but at night a rise followed by sweating.

The temperature, except in cases which ran a very rapid course, did

¹ Med. and Surg. Reporter, November, 1881.

² Bull. Soc. Anatomique, 1889.

³ Bull. et Mém. de Soc. Méd. des Hôpitaux, 1887, p. 496.

not usually rise above 102.5° or 103° in the afternoon, and in the morning was often normal; the temperature elevation, furthermore, in most cases occurred at irregular times.

In 44 cases no mention is made of fever, but it is probable that it was present in most of the cases at least.

The occurrence of *rigors* is mentioned in 14 cases only, and sweats are said to have occurred in only 9. Doubtless, in many cases, both the rigors and the sweating were overlooked, but in quite a number of cases it is distinctly stated that they were absent.

Jaundice seems to be present, so far as can be judged from the limited number of cases which I have analyzed, more frequently than is commonly supposed. Its presence is mentioned in 11 of the 108 cases. In two of these cases the jaundice was very slight, however; in one of them there were no adhesions present, and in the other it is not stated whether adhesions were present or not. Of the 9 remaining cases, in 4 there were more or less dense adhesions surrounding the liver or connecting it with adjacent organs; and in the other 5 the jaundice was due to the presence of gall-stones, or other obstruction of the duct, which had given rise to the hepatic abscess. It seems to me highly probable, therefore, that in most cases of hepatic abscess in which jaundice is present this latter symptom is due not to the abscess itself, but to pressure on the bile-ducts by adhesions, or to obstruction by gall-stones.

An *earthy tint* of the skin is mentioned by many of those who have reported cases of abscess of the liver as of common occurrence.

Ascites is reported as present in 6 cases; in one of these the probable cause was suppurative portal phlebitis; in 4, more or less dense adhesions were present, and in 1 the presence or absence of adhesions is not mentioned.

The *digestive* symptoms are variable. There is usually complete loss of appetite, but occasionally it remains good.

Nausea and *vomiting* were noted in 13 of the 108 cases, and in only 6 cases were their absence specifically mentioned.

Diarrhœa was present in 18 cases, and constipation in 10. In 2 cases there were alternate diarrhœa and constipation. In 1 case it is distinctly stated that the bowels were regular. It is evident, therefore, that the condition of the bowels is of but little value as a symptom of hepatic abscess.

Disturbance of the *nervous system*, except pain and tenderness in the region of the liver, which will be considered hereafter, is rarely mentioned. The occurrence of headache is mentioned in 3 cases, delirium in 2, and stupor in 1. No doubt in many cases there were nervous and other symptoms, which are not mentioned by the reporters of the cases; but if these symptoms had been conspicuous, it is scarcely probable that they would have been omitted.

Disturbances of the *circulatory system*, except ascites and weakness of the pulse, were very rarely mentioned. In 1 case there was enlargement of the superficial veins of the abdomen; the abscess in this case supervened "very shortly" after a blow over the liver; the patient lived three months, and at the autopsy the liver was found adherent to the diaphragm on the right side; there were no abdominal adhesions; there was some effusion (serous) in the left pleural and in the pericardial sacs. In another case there was repeated epistaxis, and in a third the pulsations of the heart were communicated to the abscess.

Disturbances of the *respiratory system* are quite common. *Dyspnea* is mentioned as a troublesome symptom in 12 cases, and *cough*, which was not usually very troublesome, however, is mentioned in 8 cases. The existence of râles, usually subcrepitant, is mentioned in a few cases, and occasionally pleuritic friction-sounds were observed. There would seem to be several causes for the disturbances of respiration in cases of hepatic abscess: (1) The pain occasioned by breathing; (2) the pressure of the abscess upward upon the lung; (3) the bursting of the abscess into the lung; (4) the bursting of the abscess into the pleural cavity; and (5) the existence of pleurisy (which may be serous) as a complication.

Disturbances of the *urinary system* are mentioned but three times in the one hundred and eight cases. Once the presence of albuminuria (five per cent.) was noted. The cause of the abscess in this case was supposed to be a wound by a pistol-ball received two years before. It is worthy of note that the spleen was enlarged in this case. The abscess was incised and drained, and the case ended in recovery. In view of the small amount of albumin present and the extreme rarity of the complication, it is probable that its presence was not connected in any way with the hepatic abscess. In only two cases, so far as I can learn, was any careful examination of the urine made to determine the amount of urea present. Both of these cases are reported by Arnaud,¹ and in one one hundred and thirty-five grains of urea were discharged a day; in the other, one hundred and twenty-three. The amount of the other constituents of the urine is not stated, nor is any statement made with respect to the presence or absence of leucin and tyrosin.

Emaciation is probably present, in greater or less degree, in nearly all cases, though it is only mentioned specifically in twenty-one of the one hundred and eight cases; in some cases, however, it is absent. In a case which I saw a few years ago there was scarcely any loss of flesh, and the thick layer of adipose tissue on the back prevented us from detecting the enlargement of the liver, which was in the back part of the right lobe. Rouis, quoted by Frerichs, says that in three cases he had seen great increase of adipose tissue.

¹ Loc. cit.

The evidence furnished by a *physical examination* of the liver is of far more value than the symptoms in cases of hepatic abscess. Of the eighty-nine cases in which the symptoms are given in some detail, *pain and tenderness* are mentioned as prominent in fifty-six; in four there was tenderness without pain; in two there was complete absence of both pain and tenderness; in the others no mention is made of pain one way or the other.

The character of the pain varies: sometimes it is quite steady; at others it occurs in paroxysms. The seat of the pain is also different in different cases, and seems, as a rule, to depend upon the direction in which the abscess is pressing; if it is pressing upward against the lung the pain is usually under the right scapula or in the right shoulder, though this does not always occur. Thus, in a case reported by Arnaud, the abscess pushed the lung upward very considerably, and yet there was no pain in the shoulder or scapular region. If, on the other hand, the abscess is on the under or front surface of the liver, the pain is usually in the epigastric or hypochondriac region. We have already seen, however, that pain may be entirely absent in such cases, even where adhesions have formed or are forming.

Enlargement of the liver, to a greater or less degree, is present in nearly all cases; it is usually sufficiently great to be plainly evident on palpation and percussion. Of the eighty-nine cases in which the symptoms are mentioned in detail, enlargement was named in sixty-three, and it was probably present in nearly all the others, for in some of them fluctuation is mentioned, and in some aspiration was practised and revealed the presence of pus. In three cases the enlargement was said to be slight; in two of these three cases the abscess was due to dysentery which had first appeared in one case two weeks and in the other three weeks before the abscess became apparent, and was incised. In the other case it was due to a blow; the abscess symptoms appeared four days after the injury, and incision was practised twenty-eight days after.

In two cases it is distinctly stated that the liver was not enlarged; one of these cases was due to dysentery, and the abscess itself was large and single; in the other there were multiple abscesses following obstruction of the bile-duct.

In one case attributed to ulceration of the cervix uteri the liver was contracted by "fibroid material."

The situation of the enlargement depends on the part of the liver involved; in the great majority of cases it is on the right side and it seems to pass upward into the chest and downward into the abdomen in about an equal number of cases. Sometimes, when the swelling can scarcely be perceived or even felt—owing to the tension of the muscles—when the patient is lying down, it becomes very evident when he stands or sits up, the epigastrium and the right hypochondrium then bulging out

very markedly; this occurs even when there are close adhesions, as in a case I have recently seen. In the case of very large abscesses the swelling may extend down to the crest of the ilium, as in a case in my own practice, which I have heretofore mentioned, and in a case reported by Hazzard, in which the enlarged liver extended upward to the third rib and downward to four inches below the ribs.

Fluctuation was only mentioned in eight of the cases which I have tabulated; and in very many cases, no doubt, it is absent in consequence of the distance of the abscess from the surface, or obscured by the condition of the abdominal walls or by tympany.

Aspiration is spoken of by most writers on the subject as a certain test of the existence of an hepatic abscess, and in the great majority of cases, certainly, in which it has been tried pus has been withdrawn, if it was present. But there are two conditions, at least, in which pus may be present and aspiration fail to reveal it: (1) The needle may not enter the abscess; (2) the contents of the abscess may be so thick that they cannot flow through the needle; this fact has been previously mentioned in speaking of the contents of hepatic abscesses and need not be dwelt upon now, further than to say that it would seem that the contents of dysenteric abscesses, and it would perhaps be fair to say those due to amœbic dysentery, are sometimes thick at a very early period. In addition to the cases mentioned by Councilman and Lafleur, in which aspiration gave a negative result, Geschwind reports one due to dysentery, which preceded the abscess by only two weeks, in which very little pus was aspirated, though three-fourths of a litre was discharged on incision.

I do not find any record of a failure to get pus when the needle entered the abscess in any except dysenteric cases, unless the abscess was of old date, and its contents had undergone caseous degeneration.

The *complications* of hepatic abscess are quite numerous, but with the exception of dysentery, localized peritonitis and consequent adhesions, and those connected with the pleura and lungs, they are rare.

The *dysentery*, which is such a frequent complication of the amœbic abscesses, has already been described very fully by Dr. Councilman, and I shall not refer to it.

Nor is it necessary to say much with respect to *peritonitis*. We have already seen that in quite a considerable proportion of cases this complication exists, but in the great majority of cases it is localized and adhesive, and so far from being a harmful matter, it is clearly beneficial when there are adhesions to the abdominal wall, because it removes to a great extent the dangers of an escape of pus into the abdominal cavity, when the abscess is incised. In the same way, also, adhesions to the hollow viscera lessen the gravity of a case in which pus is discharged into the alimentary canal.

Occasionally, however, a *generalized peritonitis* is found, which is not due to the rupture of the abscess into the abdominal cavity. Thus in a case reported by Ridlon,¹ due to ulceration of bowel, there was a generalized chronic peritonitis, and the abdomen contained sixty ounces of fluid; and Hazzard² reports two similar cases, one due to dysentery, the cause in the other being unknown.

Hemorrhage from the bowels, or rather hemorrhage into the bowels from the cavity of the abscess, is a very rare and very dangerous complication apparently—that is, if any amount of blood is discharged; in many cases, where the abscess bursts into the colon, there is a slight discharge of blood along with the pus, but this slight hemorrhage is only incidental to the rupture, and is not worth calling a complication.

Pleurisy is one of the most common of the complications of hepatic abscess; its occurrence was noted in 11 of the 108 cases. In most cases the exudate was purulent in character, and was then usually due to the rupture of the abscess into the pleural sac, but in some cases the exudate was serous; cases of this kind are reported by Hazzard,³ Feron and Constan,⁴ and Arnaud.⁵

Pneumonia is also an exceedingly common complication, as is apparent from the frequency with which hepatic abscesses burst into a bronchus; in all such cases there is a pneumonia of greater or less extent, but it does not seem to add to the gravity of the case, as a rule; on the contrary, recoveries after rupture into a bronchus are more frequent than after ruptures in any other direction.

Infarction of the spleen is rarely mentioned as a complication of hepatic abscess, and it is of little practical significance at any rate.

Meningitis is also a rare complication, so far as I can determine from the reports which I have examined; it is not mentioned in any of the 108 cases which I have analyzed, though in one of them there was an abscess of the brain. Perhaps meningitis may have been a more common complication formerly, when injuries of the head were said to be a common cause of hepatic abscess.

Caries of the ribs has been noted in several cases. Thus Chauvel⁶ reports two cases of this kind, and Byrd has recorded⁷ a case of unknown origin in which there was "necrosis of the ribs." The abscess had lasted about nine weeks when this was detected; it was very large, and there was œdema and redness of the skin over an extensive area. A very remarkable case has been reported by Hatch,⁸ in which the

¹ New York Med. Journ., April, 1880.

² Med. and Surg. Reporter, Jan. 21, 1882.

³ Loc. cit.

⁴ Gazette hebdomadaire de Sci. Méd. de Bordeaux, March 6, 1889.

⁵ Loc. cit.

⁶ Gazette des Hôpitaux, 1890, p. 91.

⁷ New York Med. Journ., July, 1878.

⁸ Lancet, January 5, 1889.

whole side sloughed away, and not only the carious ribs, but the kidney was also exposed.

An hepatic abscess may terminate in several different ways:

Absorption is said by some writers on the subject to be of occasional occurrence, but I can find no case of the kind recorded which is at all conclusive. In fact, the term "absorption" has been used sometimes, not to signify the complete disappearance of the pus, but to include its cheesy and calcareous degeneration as well. Thus Frerichs says that in most cases where absorption occurs, a cheesy or calcareous remnant remains. Now this is clearly not absorption in the proper sense of the word, and it does not seem to me proper to include those cases under this heading.

Bursting of the abscess is of comparatively common occurrence. Its actual frequency cannot readily be determined, especially since the propriety of early incision has been recognized, but the statistics of Waring will throw some light on this point. Of the 300 cases analyzed by him, 78 opened spontaneously, 48 were opened artificially, 169 died before bursting or incision, and in 5 the result in this respect was doubtful.

Of the 108 cases which I have analyzed, rupture occurred in 18, 26 died before rupture, and aspiration or incision was done in 59 cases; in 5 there is no distinct record on this point. In addition to the 26 cases in which death occurred before rupture, there were 2 in which one abscess had been incised and drained, but at the autopsy another abscess was found which had not been opened. One patient had abscesses four different times, two of which burst, and two were incised and drained. Another had three different attacks; in the first the abscess broke, the second was incised and drained, and the third was incised, but peritonitis came on and caused death. The interval between the first and second abscess was twenty months, that between the second and third five months. The *direction of the rupture* in the eighteen cases was as follows: Into a bronchus seven times, into the pleura four times, into the colon three times, into the stomach twice, into the abdominal cavity three times, outward through the abdominal walls once, and into the pericardium once. In one case rupture occurred into both the bowels and a bronchus, and in another it occurred into the lungs and peritoneal cavity; in yet another into both the pleural cavity and a bronchus. All the four cases in which the abscess broke into a bronchus only, ended in recovery, and recovery ensued also in the cases in which rupture occurred into a bronchus, and the pleural cavity and a bronchus and the bowel, respectively. Three of the four cases in which rupture occurred into the pleura terminated fatally; in the only one having a favorable termination there was an opening into the bronchus also. Of two cases in which the abscess opened into the bowel only, both died; the third, which opened into a bronchus also, ended in recovery. Both

the cases which opened into the stomach terminated fatally, and all three of those which opened into the abdominal cavity had a similar ending, as would have reasonably been supposed. It will be remembered, however, in this connection, that in one case in which pus escaped into the abdominal cavity when the abscess was opened, recovery ensued.

These cases are too few in number to justify very positive conclusions as to the frequency and gravity of rupture of an hepatic abscess in different directions, but I think one conclusion is fully justified, namely, that rupture into a bronchus, or, as it is often called, rupture into the lung, is the most common and least dangerous direction in which such rupture may occur.

Caseation and calcification of its contents are very rare terminations of an hepatic abscess, and are not mentioned in any of the 108 cases which I have analyzed.

Death is a direct result of hepatic abscess, in a large proportion of the cases. Of the 108 cases in my table, 67 terminated fatally—of this number 21 had been either aspirated or incised or drained. 43 cases terminated in recovery, and of these 38 had been either aspirated or incised. The result in three cases is not stated. It will be observed that the total number of *patients* is 108, but the total number of abscesses is 110. This result is due to the fact, previously mentioned, that one patient had three separate and distinct attacks, and another had four. There were two cases, however, in which the result is not stated. Of the 69 fatal cases, the abscesses were multiple in 39 cases, single in 24, and in 4 the number is not stated. If we compare these figures with the general proportion of multiple to single abscesses—42 of the former to 55 of the latter—it is evident that the mortality is much greater in the case of multiple than of single abscesses.

The causes of death are—(1) exhaustion; (2) septic poisoning; (3) peritonitis; (4) destruction of a large amount of hepatic tissue; (5) complications of various kinds other than peritonitis.

It is impossible to get any accurate information as to the relative frequency of the different causes of a fatal termination, because the actual cause of death is so rarely mentioned; but, so far as I can learn, exhaustion is the most serious source of danger, and a slow septicæmia—which, indeed, ultimately causes exhaustion—is next in frequency.

Whatever may be the relative frequency of these different causes of death, however, one thing is quite certain: that, as a general rule, to which there are few exceptions, the longer the abscess remains without a free opening, so that its contents can be easily discharged, the greater is the danger.

The *duration* of the fatal cases was from a few days to six months—the majority died in from six weeks to three months.

The following table will show the mortality of abscesses from various

causes; it will be observed that I do not include all the 110 cases in the table; those which are omitted were due to various causes, such as gastric and duodenal ulcer, peri-uterine inflammation, etc., but the cases attributable to any one cause are so few in number that no deductions can be drawn from them.

		Fatal cases.	Mortality.
Whole number of cases	110	67	60 per cent.
Cases due to dysentery	31	20	62 "
" " injury	12	10	83 "
" " gall-stones	8	8	100 "
Causes unknown	38	17	45 "

The other circumstances influencing the prognosis of hepatic abscess have already been considered as fully as time will permit.

The *treatment* sanctioned by results is so distinctly surgical in character that only a brief outline of it will be given here.

It is scarcely necessary to mention temperance in matters of diet and drink, a pure water-supply, and probably, also, the aseptic management of wounds, as prophylactic measures. I shall not consider the influence of the treatment of dysentery on the occurrence of hepatic abscess, because it has already been considered in the papers on dysentery.

It is very questionable whether any drugs are useful in cases of hepatic abscess, except in so far as they relieve symptoms and aid in the maintenance of the patient's strength.

In view of the extreme difficulty, or, indeed, the impossibility, of determining in a given case whether there is but one abscess or more than one, and in view, further, of the results of operative treatment as compared with expectancy, surgical measures would seem to be indicated in all cases as soon as it is certain that pus has formed, unless the abscess has opened in such a situation that it can discharge freely, and unless the absence of fever, and a general improvement in the patient's condition, give reasonable ground for hope that danger has passed.

In cases of multiple small abscesses, surgical treatment would do no good, but it would as certainly, I think, do no harm; and as it is impossible, as just stated, to recognize the existence of multiple small abscesses by any special symptoms, it seems to me the patient should have the benefit of the doubt, and an attempt at least should be made to find the pus with the aspirator.

Of course, extreme exhaustion would contra-indicate operation here, as in other surgical cases.

The last point to be considered, then, is the different operative measures which have been proposed and their relative value.

The methods which have been proposed and practised are:

1. Aspiration alone.

2. Aspiration and subsequent washing out of the cavity with some antiseptic solution through the aspirator-needle.

3. The use of a large trocar and canula alone.

4. The use of a large trocar and canula, the canula being subsequently left in to secure drainage.

5. Incision.

6. Incision and drainage.

7. Incision and washing out with some antiseptic solution with or without subsequent drainage. But practically these seven may be reduced to three, namely: 1. Aspiration. 2. Incision and drainage. 3. The use of antiseptic washes.

I shall have nothing to say as to the use of Vienna paste before the incision to insure adhesion between the liver and abdominal walls, or of the use of acupuncture for the same purpose, or of stitching of the liver to the walls, etc. These are distinctly surgical measures and do not properly belong in this paper.

Aspiration was practised in 17 of the cases which I have analyzed. Of these 17 cases, 7 ended in recovery, and 10 were fatal. In 4 cases, however, aspiration was followed later on by free incision and drainage, and of these 4, 3 recovered and 1 died. In one of the recoveries, after aspiration the cavity was washed out with carbolic solution through the aspirator-needle.¹

Incision and drainage were practised in 48 cases, and of these 35 ended in recovery, and 13 were fatal. Of the 35 cases which ended in recovery, antiseptic injections were used in 12; and of the 13 cases which ended fatally, antiseptic injections were used in 2. Of the 35 cases which ended in recovery the abscess was attributed to dysentery in 10 cases; to injury in 2, to an ulcer on the leg in 1, and in 22 cases the cause was unknown.

The causes of death were as follows: in 5, the presence of other abscesses; in one of these there was an abscess in the brain also; in another the abscess which was incised had healed. In the cases of single abscess death resulted from exhaustion three times, from peritonitis once, from pneumonia once, from waxy degeneration of the liver and kidneys once, and from persistent diarrhea once. In only one case, that of peritonitis, could the result have been due to the operation.

The value of prompt incision and drainage is perhaps universally recognized now, but I trust the statistics which I have given, dry as they are, may not be without value.

¹ Aspiration is *very rarely* dangerous, but it is not absolutely free from danger. Dr. J. C. Reeve, of Dayton, Ohio, has reported a case in which death occurred as the needle was being introduced, and Dr. Godlee refers to the danger of internal hemorrhage from the needle puncture.

I would refer again, in conclusion, to the statistics on this point of Ferron to which I have previously alluded. In 47 cases of antiseptic hepatotomy for hepatic abscess which he collected, there were 10 deaths which were caused as follows: 5 were due to multiple abscesses, 1 to pulmonary trouble, 3 to complications, and 1 to peritonitis, brought on by a counter-opening fifteen days after operation.

In 39 cases of single abscess, he says death followed antiseptic hepatotomy only once.

Of the 8 cases of multiple abscesses, 5 terminated fatally.

Of the 13 fatal cases there was but one abscess in 7; there were more than one in 5, and in 1 the number is not stated.

The following conclusions, it seems to me, are either warranted or rendered highly probable:

1. That hepatic abscesses rarely occur as a result of injuries or diseases of the bones or other parts of the body, except those directly connected with the portal system of veins, or immediately adjacent to the liver.

2. Ulceration of the bowels is a common cause of hepatic abscess, but neither the morbid changes nor the symptoms are those of simple dysentery. It is probable that in most cases, at least, when the hepatic abscess is due to dysentery the latter disease is amœbic in character.

3. An hepatic abscess may appear in two weeks from the commencement of the dysenteric attack, but the usual time is from four to twelve weeks. It is impossible to say how long a time must elapse after an attack of dysentery before all danger of hepatic abscess is past.

4. Abscesses originating in the bile-ducts and those due to injuries of the liver itself seem to be of comparatively rare occurrence. When due to injury, the abscess usually appears in a few days.

5. Abscesses occurring in connection with general septicæmia or pyæmia are probably nearly always multiple in number and small in size, but in rather more than half of all other cases the abscess is single and comparatively large. Abscesses due to gall-stones, however, are usually multiple.

6. Aspiration occasionally fails to reveal an hepatic abscess, because the needle may not enter it, or the contents of the abscess may be too thick to flow through the needle.

7. There are no means of determining with certainty the presence or absence of adhesions in a given case; pain, tenderness, and œdema over the seat of the liver suggest the presence of adhesions, but are by no means certain proof of their existence. Even the up-and-down movement during respiration of a needle inserted into the liver is not a conclusive proof that adhesions do not exist, as was shown by a case recently under my care.

8. Of the symptoms and signs of hepatic abscess, pain, tenderness,

and swelling in the hepatic region are by far the most important. Fever is present in a large proportion of cases, is intermittent in character, and except in pyæmic cases rarely rises above 102.5° or 103° . Jaundice and ascites nearly always denote the presence of dense adhesions or gall-stones. Dyspnœa and cough are frequently present.

9. It is doubtful whether absorption of the contents of an hepatic abscess ever occurs; bursting is of frequent occurrence, the most usual direction being into a bronchus or the pleural cavity. Under expectant treatment death occurs in a large proportion of cases before bursting.

10. With respect to treatment, free incision and drainage give far better results than any other mode. The results of aspiration are rarely satisfactory, nor is aspiration itself entirely free from danger.

SEROUS CYSTS IN THE CEREBELLUM.

By R. T. WILLIAMSON, M.D. (LOND.), M.R.C.P.,
MEDICAL REGISTRAR, MANCHESTER ROYAL INFIRMARY.

CYSTS of various kinds are met with in the cerebellum. Thus, there are hydatid cysts, cysts due to the *cysticercus cellulosa*, cysts following hemorrhage or softening, cystic tumors, and also a very rare variety of cysts—the so-called simple or serous cysts. A number of cases have been recorded in which post-mortem examination has revealed a cyst in the cerebellum containing clear fluid, and as no evidences of the first five above-mentioned causes have been detected, the cases have been described as simple or serous cysts of the cerebellum of obscure origin.

Gowers and Bastian mention these so-called simple or serous cysts; and cases have been recorded by Sharkey, Hadden, Habershon, and others. All writers on the subject have had great difficulty in explaining the origin of these cysts.

Of course, a cerebellar cyst can only be classed as a simple or serous cyst when the history and pathological examination have failed to reveal any evidence of hydatid, *cysticercus cellulosa*, hemorrhage or hæmatoidin crystals, or tumor growth. The object of the present communication is to draw attention to the very great difficulty, if not impossibility, of excluding tumor as a cause of apparently simple cerebellar cysts.

Until a most careful and minute *microscopical examination of every part of the cyst-wall* has been made, one is not justified in excluding tumor and describing the case as one of simple cyst. I have recently met with two cases which seem worthy of brief record from their bearing on this point. In both cases, after careful dissection and fairly complete